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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/800,258 | 03/11/2004 | Joel S. Burton | APL1P303/P3263 | 9100 |

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| EXAMINER | |
|---|---|
| SUGENT, JAMES F | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2116 | |

DATE MAILED: 07/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/800,258 | BURTON, JOEL S. | |
| | Examiner | Art Unit | |
| | James Sugent | 2116 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *11 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6 and 10-20* is/are rejected.

7)☒ Claim(s) *4-5 and 7-9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

The Office hereby acknowledges receipt of the following and placed of record in file: claims 1-20 are presented for examination.

### *Allowable Subject Matter*

Claims 4-5 and 7-9 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 10-11, 13 and 20 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kung et al. (U.S. Patent No. 6,636,910 B2) (hereinafter referred to as Kung).

As to claim 10, Kung discloses a method for regulating temperature in a mass storage device (60) comprising: monitoring the temperature of the mass storage device (column 3, lines 46-54); and reducing power consumption when the temperature exceeds a certain threshold (column 3, lines 50-58); wherein the mass storage device is capable of operating while the power consumption is reduced column (Kung discloses a hard disk that reduces power consumption

when a temperature threshold exceeded and simultaneously sends requests while adjustments are made to the power consumption; column 3, lines 50-62).

As to claim 11, Kung discloses a method wherein the mass storage device is a hard drive (column 3, lines 27-31).

As to claim 13, Kung discloses a method wherein the power consumption is reduced by reducing seek speed of the hard drive (Kung discloses decreasing reducing the speed of data process circuitry and therefore seek speed; column 3, lines 50-62).

As to claim 20, Kung discloses a hard drive (60) that autonomously manages its temperature comprising: a hard platter that rotates (94; column 3, lines 40-42); heads that read and write information to the magnetic medium (92; column 3, lines 32-35); a magnetic medium that stores information; an arm that holds the heads (Though Kung does not explicitly disclose a magnetic medium or arm to hold the heads, it is inherent in the art that a hard disk comprises a magnetic medium and arm to hold the heads); a temperature sensor (82) that measures temperature (column 3, lines 46-49); an integrated controller (80) that can reduce power consumption when the temperature exceeds a certain threshold, wherein the hard drive is capable of operating while the power consumption is reduced (Kung discloses a hard disk that reduces power consumption when a temperature threshold exceeded and simultaneously sends requests while adjustments are made to the power consumption; column 3, lines 50-62).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forrer, JR. (U.S. Patent Publication No. 2003/0191889 A1) (hereinafter referred to as Forrer) in view of Mittal et al. (U.S. Patent No. 5,719,800) (hereinafter referred to as Mittal).

As to claim 1, Forrer discloses a method for a peripheral device (hard disk 300) to regulate its temperature by regulating its power consumption, comprising: reducing offline diagnostic activities (providing its own mechanism to protect itself from temperature conditions by turning off SMART technology and therefore turning off offline diagnostic activities) if the temperature of the peripheral device exceeds a first temperature (65 degrees Celsius) (paragraph 35); reducing operational speed (limiting access rate) in which the peripheral device fulfills requests from a host device if the temperature of the peripheral device exceeds a second temperature (75 degrees Celsius) (paragraph 36); and reducing power consumption of a physical layer interface (shutting of the spindle motor and all electronics except for processor 302) that connects the peripheral device to the host device if the peripheral device exceeds a third temperature (85 degrees Celsius) (Forrer discloses the hard disk 300 reducing power consumption of the physical layer interface by shutting of the spindle motor and all electronics except for processor 302 and therefore reducing power consumption through the interface to the host; paragraph 37).

Forrer does not disclose reducing power consumption of a physical layer interface when a third temperature threshold is exceeded *and the peripheral device experienced a period of inactivity that exceeds a first time threshold.*

Mittal teaches a method for reducing power consumption to an IC when an activity monitor (106) exceeds an activity level and a temperature level of the substrate of the IC (column 5, lines 31-42). Mittal has the additional feature of reducing the worst-case power consumption of the IC without reducing performance of the normal operations (column 2, line 65 thru column 3, line 3).

It would have been obvious to one of ordinary skill of the art having the teachings of Forrer and Mittal at the time the invention was made, to modify the temperature regulating method of Forrer to include monitoring both activity and temperature as taught by Mittal such that when a third temperature threshold is exceeded and an activity level is exceeded to decrease power consumption to the hard drive. One of ordinary skill in the art would be motivated to make this combination of temperature and activity monitoring in view of the teachings of Mittal, as doing so would give the added benefit of reducing the worst-case power consumption of the IC without reducing performance of the normal operations (as taught by Mittal above).

As to claim 2, Forrer together with Mittal taught the method regulating temperature in a peripheral device according to claim 1, as shown above. Forrer further teaches wherein the first temperature is lower than the second temperature (65 degrees Celsius is lower than 75 degrees Celsius).

As to claim 3, Forrer together with Mittal taught the method regulating temperature in a peripheral device according to claim 1, as shown above. Forrer further teaches wherein the second temperature is lower than the third temperature (75 degrees Celsius is lower than 85 degrees Celsius).

As to claim 6, Forrer together with Mittal taught the method regulating temperature in a peripheral device according to claim 1, as shown above. Forrer further teaches wherein the peripheral device is a hard drive (paragraph 26).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kung et al. (U.S. Patent No. 6,636,910 B2) as applied to claims 10 and 11 above, and further in view of Forrer, JR. (U.S. Patent Publication No. 2003/0191889 A1).

As to claim 12, Kung discloses a method regulating temperature in a mass storage device according to claim 11, as shown above. However Kung does not disclose a method wherein the power consumption is reduced by suspending offline diagnostic activities.

Forrer teaches a method and apparatus for managing operation of a storage device using temperature thresholds. Forrer further teaches the power consumption is reduced by suspending offline diagnostic activities (Forrer teaches the storage device providing its own mechanism to protect itself from temperature conditions by turning off SMART technology and therefore turning off offline diagnostic activities; paragraph 35). Forrer has the additional benefit of keeping the mass storage device from failing immediately (paragraph 7, lines 3-8).

It would have been obvious to one of ordinary skill of the art having the teachings of Kung and Forrer at the time the invention was made, to modify the power management method of Kung to include reducing power consumption by suspending offline diagnostic activities as taught by Forrer. One of ordinary skill in the art would be motivated to make this combination of reducing power consumption by suspending offline diagnostic activities in view of the teachings of Forrer, as doing so would give the added benefit of keeping the mass storage device from failing immediately (as taught by Forrer above).

Claims 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forrer, JR. (U.S. Patent Publication No. 2003/0191889 A1) as applied to claims 10 and 11 above, and further in view of Schmidt et al. (U.S. Patent No. 7,002,884 B2) (hereinafter referred to as Schmidt).

As to claim 14, Kung discloses the method for regulating temperature in a mass storage device according to claim 11, as shown above. Kung discloses the hard drive has a physical layer interface (58) that is connected to a host (54 and 56) but fails to disclose the physical layer interface has different power modes and the power consumption is reduced by changing the power mode of the physical layer interface.

Schmidt teaches a power down mode for a storage device. Schmidt further teaches the method reducing power at the physical layer interface using multiple power modes (column 2, line 62 thru column 3, line 21). Schmidt has the additional feature of stepping down rotation speed of a mass storage device to save power (column 1, lines 36-42).

It would have been obvious to one of ordinary skill of the art having the teachings of Kung and Schmidt at the time the invention was made, to modify the temperature regulating method of Forrer to include decreasing power at the physical layer interface with different power modes as taught by Schmidt. One of ordinary skill in the art would be motivated to make this combination of decreasing temperature by regulating the power in the physical layer interface in view of the teachings of Schmidt, as doing so would give the added benefit of stepping down rotation speed of a mass storage device to save power (as taught by Schmidt above).

As to claim 15, Kung together with Mittal taught the method for regulating temperature in a mass storage device according to claim 14, as shown above. Schmidt further teaches the

method wherein the power mode is changed only if a period of inactivity where the host device has not used the hard drive has elapsed (column 2, line 62 thru column 3, line 21).

As to claim 16, Kung together with Schmidt taught the method for regulating temperature in a mass storage device according to claim 15, as shown above. Schmidt further teaches the method wherein the power mode reverts back to its original mode when the host attempts to use the hard drive (column 2, line 62 thru column 3, line 21).

As to claim 17, Kung together with Schmidt taught the method for regulating temperature in a mass storage device according to claim 14, as shown above. Schmidt further teaches the method wherein the power mode is changed from active to partial (column 2, line 62 thru column 3, line 21).

As to claim 18, Kung together with Schmidt taught the method for regulating temperature in a mass storage device according to claim 14, as shown above. Schmidt further teaches the method wherein the power mode is changed from partial to slumber (column 2, line 62 thru column 3, line 21).

As to claim 19, Kung discloses the hard drive being placed into a reduced power state if a temperature threshold is achieved, as shown in claim 11 above. However Kung fails to disclose the hard drive placed into a standby state, and wherein power consumption is reduced by placing the hard drive into the standby state if a period of inactivity where the host device has not used the hard drive has elapsed.

Schmidt teaches a power down mode for a storage device. Schmidt further teaches the method reducing power at the physical layer interface using multiple power modes when periods of inactivity are detected (column 2, line 62 thru column 3, line 21). Schmidt has the additional

feature of stepping down rotation speed of a mass storage device to save power (column 1, lines 36-42).

It would have been obvious to one of ordinary skill of the art having the teachings of Kung and Schmidt at the time the invention was made, to modify the temperature regulating method of Forrer to include decreasing power at the physical layer interface with different power modes as taught by Schmidt. One of ordinary skill in the art would be motivated to make this combination of decreasing temperature by regulating the power in the physical layer interface in view of the teachings of Schmidt, as doing so would give the added benefit of stepping down rotation speed of a mass storage device to save power (as taught by Schmidt above).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Sugent whose telephone number is (571) 272-5726. The examiner can normally be reached on 8AM - 4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Browne can be reached on (571) 272-3670. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or (571) 272-1000.

James Sugent
Patent Examiner, Art Unit 2116
July 5, 2006

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